What is claimed is:

1. An apparatus comprising:

a polymer ferroelectric memory device; and

a heater coupled to the polymer ferroelectric memory device to heat the polymer ferroelectric memory device.

2. The apparatus of claim 1 further comprising:

a temperature detector coupled to the heater to detect the temperature of the heater.

3. The apparatus of claim 2 wherein the temperature detector is an on-chip temperature sensor.

4. The apparatus of claim 2 wherein the heater further comprises:

a metal array; and

a current source coupled to the metal array to supply current to the metal array to generate heat.

5. The apparatus of claim 4 wherein the metal array has a serpentine pattern.

6. The apparatus of claim 5 wherein the metal array further comprises:

a plurality of non-intersecting metal traces wherein at least one metal trace is coupled to the temperature detector and the other metal traces are coupled to the current source.

7. The apparatus of claim 5 wherein the metal array further comprises:

a non-intersecting metal trace; and

a plurality of contact pairs coupled to the non-intersecting metal trace wherein one contact pair is coupled to the temperature detector and another contact pair is coupled to the current source.

8. The apparatus of claim 1 wherein a polymer of the polymer ferroelectric memory device is polyvinylidene fluoride.

9. The apparatus of claim 1 wherein a polymer of the polymer ferroelectric memory device is a polyvinylidene fluoride trifluoroethylene copolymer

10. The apparatus of claim 1 further comprising a dielectric layer coupled to and between the polymer ferroelectric memory element and the heater to electrically isolate the polymer ferroelectric memory element from the heater.

11. A method comprising:

heating, with an on-chip heater, a ferroelectric polymer to a temperature above its Curie temperature;

maintaining the temperature for a time period;

cooling the ferroelectric polymer to crystallize the ferroelectric polymer.

12. The method of claim 11 further comprising:

exposing the ferroelectric polymer to an electric field as it cools from the temperature above its Curie temperature.

13. The method of claim 11 further comprising:

detecting, with a temperature detector, the temperature of the on-chip heater

14. The method of claim 11 wherein the ferroelectric polymer comprises a polymer ferroelectric memory device.

15. The method of claim 11 wherein the ferroelectric polymer is polyvinylidene fluoride.

16. The method of claim 11 wherein the ferroelectric polymer is a polyvinylidene fluoride trifluoroethylene copolymer.

17. The method of claim 11 wherein the Curie temperature is approximately between 130°C and 150°C

18. The method of claim 17 wherein the Curie temperature is approximately 135°C

19. The method of claim 11 wherein the time period is approximately between 5 and 15 minutes.

20. The method of claim 19 wherein the time period is approximately 10 minutes.

21. A method comprising:

annealing, with an on-chip heater, a polymer ferroelectric memory device.

22. The method of claim 21 wherein annealing the polymer ferroelectric memory device further comprises:

heating, with the on-chip heater, the polymer ferroelectric memory device to a temperature above the Curie temperature of a ferroelectric polymer;

maintaining the temperature for a time period;

cooling the polymer ferroelectric memory device to crystallize the ferroelectric polymer.

23. The method of claim 22 further comprising:

exposing the ferroelectric polymer to an electric field as it cools from the temperature above its Curie temperature.

24. The method of claim 22 further comprising:

detecting, with a temperature detector, the temperature of the on-chip heater.

25. The method of claim 22 wherein the ferroelectric polymer is polyvinylidene fluoride.

26. The method of claim 22 wherein the ferroelectric polymer is a polyvinylidene fluoride trifluoroethylene copolymer.

27. The method of claim 22 wherein the Curie temperature is approximately between 130°C and 150°C

28. The method of claim 27 wherein the Curie temperature is approximately 135°C

29. The method of claim 22 wherein the time period is approximately between 5 and 15 minutes.

30. The method of claim 29 wherein the time period is approximately 10 minutes.

31. The method of claim 22 wherein annealing the polymer ferroelectric memory device further comprises:

initializing the polymer ferroelectric memory device.

32. The method of claim 22 wherein annealing the polymer ferroelectric memory device further comprises:

refreshing the polymer ferroelectric memory device.